

banks to a depth of four feet. Twelve were drowned and many others received severe injuries. Only the lightning flashes enabled the frightened inhabitants to partly see and avoid the dangers that surrounded them. Buildings standing on high ground or in the outskirts of the town alone escaped. Loss of life and property from violent storms on the same date occurred in other towns in Missouri, Kansas, and Arkansas.

On the 7th rain was reported from central Kansas to the Ohio River and southeasterly to Florida, and was quite generally accompanied by winds of great velocity. In Putnam and Morgan counties, Ga., several lives were lost and many injuries sustained. In many localities within the States of Tennessee, Texas, Missouri, and Kansas, wind and rain destroyed crops, fruit trees, and small buildings, inflicting large damage in the aggregate, although serious local disaster was not sustained.

About 6 p. m. of this date Chicago was visited by a furious storm of wind and rain. One man was drowned by the upsetting of a boat in the Lake, where the wind imperiled many craft. Several persons were injured by flying timber and glass, many large plate windows being hurled through the air. On Lake Geneva, Wis., a steam launch was swamped and the six occupants drowned.

From the 9th to the 13th no destructive storms were reported. On the afternoon of the 13th a tornado swept over the country in the vicinity of the City of New York. Fatalities occurred at Woodhaven, L. I., and Cherry Hill, N. J. The last-named town was practically demolished; three persons were killed and many more were hurt; 25 families were left homeless, and other losses of property resulted.

At Woodhaven one person was killed, nearly thirty were injured, and a large amount of property was destroyed. In these cases the devastation was wrought in the space of but a few minutes. The wind was preceded by hail, and thunder and lightning accompanied the violent rainfall. Damages to growing crops during these storms were reported in the southern parts of Massachusetts and Connecticut.

On the night of the 16th and morning of the 17th a severe rain and windstorm did large damage in central Illinois. It was the most disastrous within many years at Peoria, Bloomington, and Dixon, Ill., and extended into Indiana and Missouri.

Late on the 18th and early on the 19th, heavy rainfall occurred in Iowa, Minnesota, Kansas, and Illinois. Precipitation was unusually heavy at St. Paul and Winona, Minn.; Iowa City and Iowa Falls, Iowa; Paris, Trenton, and Marshall, Mo.; and Pekin and Peoria, Ill. Wind was destructive at Pekin, and serious damage resulted from overflowing streams in Iowa. Storms of unusual severity, though of circumscribed area, were reported in southeastern Wisconsin and eastern Kansas.

On the afternoon of the 19th rain, succeeded by hail and terrific winds, wrought losses in the Ohio oil fields near Findlay, amounting to \$500,000 within the town, and injured property in the surrounding country to about the same extent. The city of St. Clair, Mich., was visited by a storm of like character, and but little less violence, about the same hour. One death was caused and damages to property estimated at \$15,000. Heavy rain, with thunder and lightning, all of unusual violence, were reported from various towns in Indiana, Iowa, Illinois, and Tennessee.

On the afternoon of the 20th the eastern suburbs of Baltimore and the adjoining county were swept by wind of 70 miles an hour. Buildings were destroyed and one child was killed. The track was about 600 yards wide. A blinding rain accompanied the wind. A tornado on the same day destroyed property in the counties of Sullivan, Ulster, and Orange, N. Y.; New York City was also touched. In Ottertail County, Minn., on the same afternoon, buildings were

destroyed, injuries, supposed to be fatal, sustained, and large losses visited upon growing grain and farm property.

On the afternoon of the 22d the newspapers reported 5 inches of rain as having fallen at Silver City, N. Mex., and that a large portion of the town had been carried away by the flood. Similar storms, of lesser though destructive energy, occurred on the same day at various localities in Illinois, Kentucky, Ohio, Indiana, and Pennsylvania. In Hamilton County, Ohio, a destructive wind attended the rain, unroofing buildings and tearing up trees. Farm animals were drowned, and deaths from lightning were reported. In central Pennsylvania the flood of rain inundated farms and in the coke regions the losses were enormous, involving coke ovens, bridges, railroads, and highways.

On the 25th a tornado struck the town of Baird, near Fort Worth, Tex., killing one man and wrecking several buildings. On the same day hail did damage to the extent of several hundred dollars in central New York and near Marshalltown, Iowa.

Disastrous storms occurred on the 26th and 27th in North Dakota, eastern Missouri, Iowa, Illinois, and Indiana. On the 26th hail in four counties destroyed many thousand acres of wheat, and a tornado followed, killing one man and adding largely to the loss of property. The storm track was estimated at 200 miles in length, and, at places, 4 in width. At Kewanee, Henry County, Ill., a terrific thunderstorm, attended by wind of great violence, left marks upon nearly every house in the town. Several buildings were unroofed and otherwise seriously damaged, leaving the contents at the mercy of the drenching rain.

The counties of Bureau, Peoria, Marshall, Woodford, and Whiteside, Illinois, sustained severe losses from the same storm, the agencies being wind, rain, and lightning.

On the 27th very nearly 2.50 inches of rain fell within four hours at St. Louis. A wind of great velocity prevailed for about two hours at various points in central Ohio and Indiana. Buildings were injured, growing crops destroyed, and farm animals killed.

On the 29th storms of unusual severity occurred at points in Oklahoma, Colorado, Kansas, Iowa, and Missouri.

One of the heaviest rains recorded at Denver was on the 30th, when 0.9 inch fell within twenty-five minutes. Streets were flooded, horse cars stopped, and lightning did damage reckoned at \$5,000.

On the 31st Socorro, N. Mex., was overwhelmed by water pouring from a cloud-burst on the mountain side above the city. Six lives were lost, and the losses in and near the town were estimated at more than \$100,000. A similar disaster, from the same cause, was reported on that date from Casper, Wyo.; two persons were drowned, but the damage to property was less than at Socorro.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers, but both the mean temperatures and the departures from the normal are given for the current month for the regular stations of the Weather Bureau in Table I.

The *monthly mean temperature* published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *distribution* of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain Plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the

country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The highest mean temperatures were: Yuma, 89.2; Tucson, 87.0; Corpus Christi, 84.0. The lowest mean temperatures were: Point Reyes Light, 54.6; East Clallam, 55.6; Tatoosh Island and Eureka, 56.0.

The regular diurnal period in temperature is shown by the hourly means given in Table IV for all stations having self-registers.

The current departures from the adopted normal temperatures for July show an excess only in Nova Scotia, New Brunswick, and on the northern coasts of California and Washington. The greatest excesses were: Chatham, 2.6; and Sydney, 2.2. The temperature was generally deficient over the rest of the country, the greatest deficiency being: Lander, 5.8; Cheyenne, 5.4; Pueblo and Washington, 4.8.

Considered by districts, the current departures from normal temperatures are as given in Table I. There were no positive departures. The greatest negative departures were: Abilene (southern slope), 3.9; middle slope, 3.7; Middle Atlantic, northern slope, and southern plateau, 3.1.

The accumulated monthly departures from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
North Dakota	+ 5.4	+ 0.8	New England.....	- 3.6	- 0.5
Middle plateau.....	+ 6.0	+ 0.9	Middle Atlantic.....	-12.8	- 1.8
North Pacific.....	+ 0.2	+ 0.0	South Atlantic.....	-18.3	- 2.6
Missouri Valley.....	0.0	0.0	Florida Peninsula.....	-12.8	- 1.8
			East Gulf.....	-19.0	- 2.7
			West Gulf.....	-17.9	- 2.6
			Ohio Valley and Tenn.....	-15.9	- 2.3
			Lower Lakes.....	- 7.5	- 1.1
			Upper Lakes.....	- 1.1	- 0.2
			Upper Mississippi.....	- 4.5	- 0.6
			Northern slope.....	- 9.0	- 1.3
			Middle slope.....	- 8.0	- 1.1
			Southern slope (Abilene).....	-19.4	- 2.8
			Southern plateau.....	- 8.1	- 1.2
			Middle plateau.....	- 8.6	- 1.2
			Middle Pacific.....	- 1.8	- 0.3
			South Pacific.....	- 4.4	- 0.6

The years of highest and lowest mean temperature for previous years in July are shown in Table I of the REVIEW for July, 1894. The mean temperature for the current month was not the highest on record at any regular station of the Weather Bureau. It was the lowest on record at: Pueblo, Denver, Fresno, Salt Lake City, Winnemucca, Idaho Falls, and Walla Walla.

The maximum and minimum temperatures of the current month are given in Table I. The highest maximum was: Yuma, 113. The lowest maximum: Tatoosh Island, 73.

The highest minimum was: Corpus Christi, 76; the lowest minima, Port Crescent, 35, and Havre, 36.

The years of highest maximum and lowest minimum temperatures are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Parkersburg, Sandusky, Fort Canby, and Astoria. The minimum temperatures were the lowest on record at: Block Island, New York, Baltimore, Washington, Cape Henry, Louisville, Columbus, Ohio, Cleveland, Sandusky, Detroit, Port Huron, Sault Ste. Marie, Chicago, Milwaukee, Green Bay, Duluth, St. Paul, La Crosse, Dubuque, Des Moines, Kansas City, Concordia, Sioux City, Miles City, Baker City, Pueblo, Abilene, and Jupiter.

The greatest daily range of temperature and the extreme monthly range are given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station. Among the greatest daily ranges the large values were: Huron, 49; Idaho Falls, 47; Winnemucca, 46; Lander, 44. The small values were: Port Eads, 11; Corpus Christi, 12; Key West, 15; Hatteras, Block Island, Woods Hole, and Nantucket, 17. Among the extreme monthly ranges the large values were: Havre and Idaho Falls, 59; Huron, 58; Concordia, 57; Sioux City and Walla Walla, 56. The small values were: Corpus Christi, 13; Port Eads and San Diego, 17; Key West, 18.

No injurious frosts were reported during July.

MOISTURE.

The quantity of moisture in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The rate of evaporation from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporimeter may be made to give the quantity of water evaporated from a similar surface during any interval of time. Such an evaporimeter, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this quantity the average humidity of the air during any given interval of time may be deduced.

The sensible temperature experienced by the human body and attributed to the atmosphere depends not merely upon the temperature of the air, but equally upon the dryness and the wind. The temperature of the wet-bulb thermometer as obtained by the whirling apparatus used in the shaded shelter corresponds to the temperature felt by persons standing in the shade of trees or houses, exposed to a natural breeze of at least 6 miles per hour. This temperature and its depression below the dry bulb are the fundamental data for all investigations into the relation between human physiology and the atmosphere. In order to present a monthly summary of the atmospheric conditions from a hygienic and physiological point of view, Table VIII has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time.

PRECIPITATION.

[In inches and hundredths.]

The distribution of precipitation for the month of July, 1895, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The precipitation for the current month was heaviest, over 12 inches, in Florida and western Missouri, and nearly 12 in southern Louisiana, but least, averaging less than 0.5, over the Rocky Mountain Plateau Region, California, Oregon, and the interior of Washington.

The normal distribution of precipitation for each month is shown in the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, compiled to the end of 1891, with annual, seasonal, monthly, and other charts."

The diurnal variation is shown by Table XII, which gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 6 are weighing gauges.

The current departures from the adopted normal precipitation for July are given in Table I, which shows that precipi-